

## **LUMBAR SPINE STENOSIS**

### **SURGERY: NERVE ROOT DECOMPRESSION, RECALIBRATION**

Your diagnostic tests as well as the physical examinations have shown that you are suffering from **spinal instability**.

Before you should undergo surgery, it is important that you become familiar with your illness, the surgical procedure and what you, yourself, may do in order to help decrease your pain. It is important for us, that we provide you with enough information so that, when we ask for your consent to surgery at the end of this document, you will be able to make your decision responsibly. Please read this material carefully and consult with your treating doctor should you have any questions.

#### **THE STRUCTURE OF THE LUMBAR SPINE**

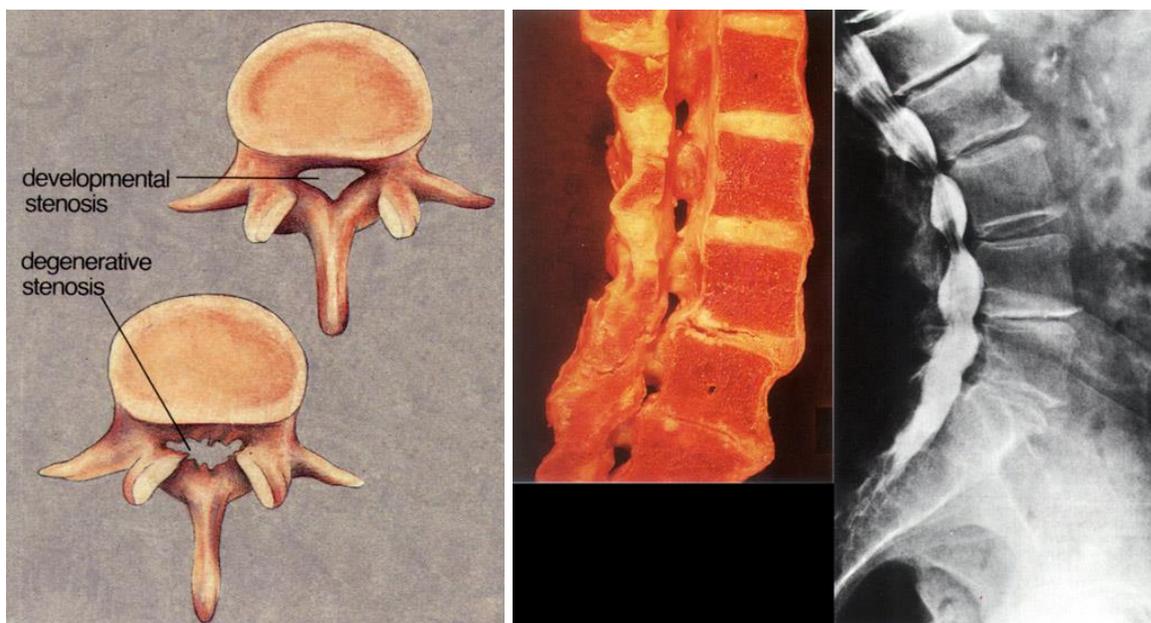
The weight bearing structure of the lumbar spinal canal consists of five lumbar vertebrae and five intervertebral discs. The posteriorly extending vertebral arches enclose the spinal canal thus protecting the nerve components found within it. The more injury prone central nervous system usually ends at the level of either the first or second lumbar vertebra from whence its processes and the cauda equina (the “horse’s tail”) created by the peripheral nerves, travel downward toward the sacrum.

The peripheral nerves are mixed nerves, that is they consist of sensory, motor and vegetative (control bowel, urinary and sexual functions) nerves. Thus, if the nerve elements of the lumbar spine are put under pressure for any reason, mixed nerve impairment should be expected, that is damage to muscle strength and sensation and pain will develop. In advanced cases, regulation of bowel, urinary and sexual function might also be impaired.

Another characteristic of the human spine is mobility occurring with the help of the many intervertebral discs and lumbar facet joints. Since these elements are rich in sensors, their function disorder resulting from degeneration and calcification, cause much pain.

## WHAT IS SPINAL STENOSIS?

We speak of spinal canal narrowing (stenosis) when the canal is narrower than expected. The nerves found within the canal are able to conform, up to a point, to the space available, continuing relative nerve function even under extreme narrowed spinal canal conditions. Under these circumstances, however, when the reserves have run out, the spine becomes more vulnerable to injury, its performance capacity such as walking, weakened.



Illust.1: Spinal Canal Stenosis

Spinal canal stenosis - as far as its location is concerned - may be central, lateral or foraminal or, often, their combination. It may develop on one or both sides, on one or more levels, may be on combination with a slipped vertebra (spondylolisthesis) or with curvature of the spine as the result of degeneration.

In the case of a genetically narrowed spinal canal, the secondary or acquired narrowing factor is exponentially increased.

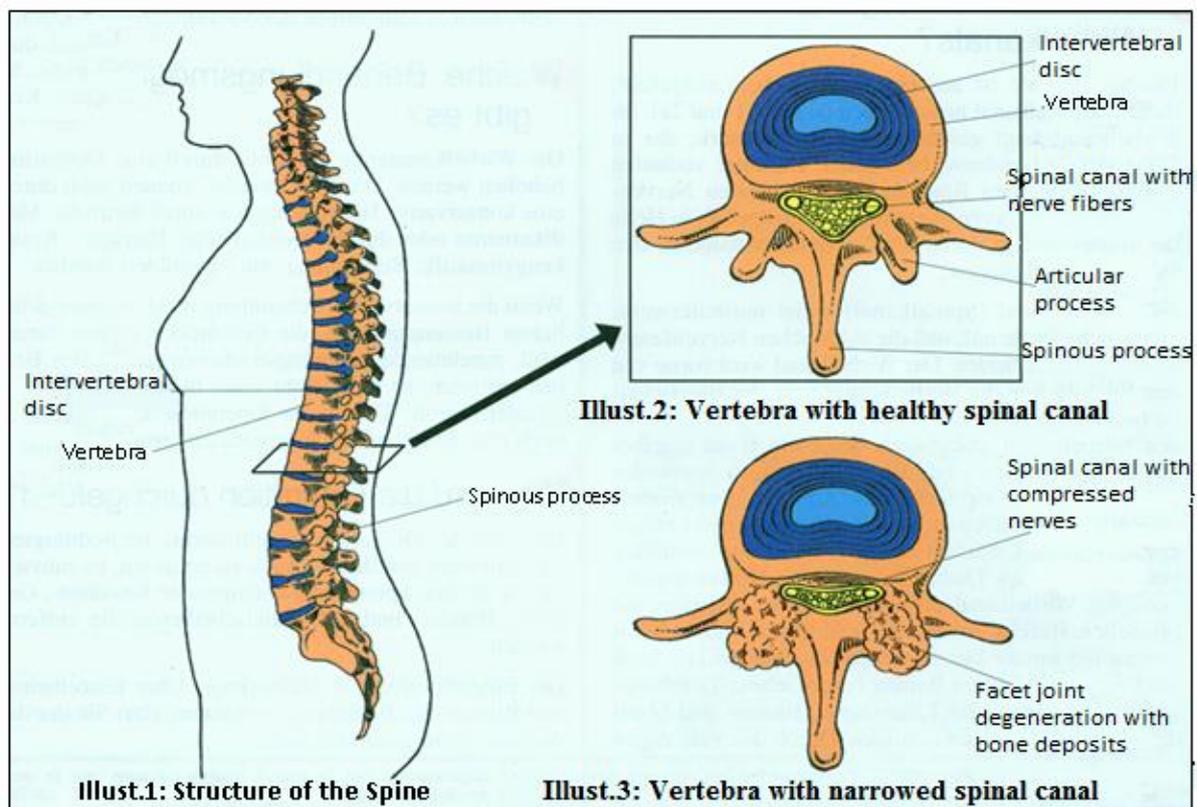
Gradual increased spinal canal narrowing is usually accompanied by decreased mobility. If instability is present at the level of the canal narrowing, this usually increases the complaints possibly requiring stabilizing surgery together with restore the width. Your doctor will evaluate whether you will need stabilization in addition to restoring the spinal canal diameter size.

The narrowing of the lumbar spine canal is principally a disorder of the middle aged and the elderly.

## WHAT ARE THE BASIC SYMPTOMS OF THE DISEASE?

- Pain:
  - The lumbar and zonal pain as well as the pain running down the posterior exterior surface of the lower extremity towards the buttocks, thigh and knee may have their origin in the supportive structure of the spine.
  - Pain along the anterior-interior surface of the limb, beneath the knee or in the groin and accompanied by numbness, may be due to compression of the nerve elements.
- Shortened walking distance, as much as to just a few meters. The Patient must sit down or bend forward before being able to go on.
- Weakness, numbness, sensory disturbance of the lower extremities.
- Antalgic posture to avoid pain.
- Complaints increase when standing, decrease or even stop when sitting or lying down.

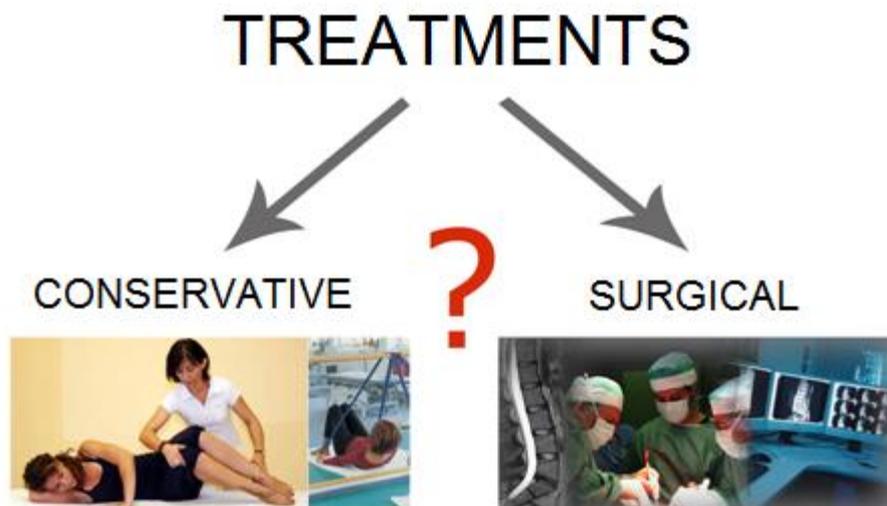
The complaints may be one-sided or on both sides, constant or recurring and, at the start, respond well to surgical treatment.



Illust.2: The structure of the spine, vertebra with healthy spinal canal and narrowed canal

## WHAT TREATMENTS ARE AVAILABLE?

Basically, there are two treatment possibilities:



### 1. NON-SURGICAL (CONSERVATIVE) TREATMENT

The sequestered particles lose most of their water content in weeks or months and shrivel. As a result, the compression on the nerves is decreased and the inflammation ceases. We often experience in this case that the symptoms caused by the herniated disc decrease in just a few days even and then stop altogether.

**In cases where there is no, or only a slight, indication of nerve root involvement, conservative treatment is preferred.**

#### Goal:

- To decrease nerve inflammation in order to
  - increase walking distance,
  - decrease pain, and,
  - increase muscle strength.

#### Methods:

- During the first days, bed rest (3-4 days).
- Pharmacological and other physiotherapy and alternative methods.

The most effective treatment method is a **series of anti-inflammatory IV infusions** together with **physiotherapy**.

#### Longterm:

- Life style changes: decrease/stop alcohol intake and smoking, change dietary habits, lose weight, reduce stress, etc.
- Treat sleep and other related psychosomatic disorders (i.e., chronic gynecological and cardiovascular diseases, as soon as possible).
- Restore physical and emotional state.
- Increase activities: regular exercise, followed by, physical training.

If, in spite of the required quality and length of the conservative treatment, there is no improvement or neurological symptoms, such as lower extremity paralysis appear, then surgery is necessary to free the nerve from the excessive compression.

## **2. SURGERY**

Surgery's goal is to stop the source of nerve compression and pain. (*Surgery does not guarantee that no new hernia will appear on the same lumbar spine segment level or on any other discs!*)

### **WHAT HAPPENS BEFORE SURGERY?**

#### **1. Preparing for hospitalization**

- **Laboratory tests, X-rays, ECG, ultrasound examinations and anaesthesiological consultation.** In acute cases, these tests are made following hospitalization.

#### **2. Reminder (definitely consult with your doctor)!**

- Non-emergency surgery may be performed only after 3-6 weeks following upper respiratory inflammation, urinary tract infection or other infections.
- Stop taking anticoagulants a few days before surgery.
- Syncumar, Warfarin and Clopidogrel must be stopped for 10 days; ASA, Aspirin protect, and other such medications must be stopped for 5-6 days and Heparin derivatives substituted by injections.

#### **3. Inhospital Preparation**

- Anti-thrombotic injection is given the afternoon prior to surgery and sedatives the night before.
- The day of surgery:
  - disinfectant bath,
  - removal of dentures,
  - removal of nail polish,
  - anti-embolism support stockings or bandages applied,
  - regular medications taken with one swallow of water as discussed with the anaesthesiologist beforehand,
  - presurgery injection (premedication)
  - infusion begun – as indicated by doctor

**Do not drink anything besides the liquid needed for your medications, do not eat and do not smoke!**

### **WHAT HAPPENS IN THE OPERATING ROOM?**

- The surgery will be performed under anaesthesia. The anaesthesiologist will inform you ahead of time regarding the particulars of the anaesthesia and ask you to sign a consent form.
- Once you are on the operating table, you will be turned onto your stomach.
- The surgical area may be shaved.
- The surgical area and the surrounding skin will be washed with a disinfectant several times.
- You will be covered with a sterile sheet with only the surgical area exposed (isolation).



Illust.3: Isolating the Surgical Area

## THE SURGICAL PROCEDURE

- The level of the narrowing is located with the help of an image intensifier.



• Illust.4: Determining the Level

- Generally, an incision measuring 3-5cm in length is made above the abnormal spine segment.
- Once the skin is separated and the tissues below exposed, haemostasis (the control of bleeding) follows.
- The musculature is slid off the surrounding vertebral arches - carefully, so as not to cause damage and make a small incision on the posterior wall of the spine.
- While keeping the nerves away, the bony-cartilaginous deposits causing the narrowing, hardened ligaments and possible narrowing factors of disc origin are removed with special instruments.
- One or two drains are placed in the wound to remove effused blood.
- The wound is closed in several layers, covered with a sterile bandage.

## **WHAT HAPPENS AFTER SURGERY?**

- You will remain in the operating room for a time after surgery for observation
- Depending on your condition, you will be taken either to the observation room or the ICU.
- The anaesthesia will gradually wear off in a few hours, whereupon, you will be given an injection or pills to lessen your pain.
- It is important that you begin doing breathing and vascular exercises as well as locomotion routines soon after under the guidance of a physiotherapist, in spite of pain.
- Anti-thrombotic injections are routinely given.
- It is important that you drink plenty of fluids such as fruit juice, tea, soup and non-carbonated mineral water.
- You will be able to get out of bed one day after surgery with the physiotherapist's assistance.
- It is important that you heed your physiotherapist!
- The drain is removed from the wound 1-2 days after surgery.
- You may be discharged in 2-3 days after surgery, if no problems arise.
- At discharge:
  1. You will be given your Hospital Discharge Summary papers.
  2. Please consult your treating doctor for any questions!
- You must strictly keep the wound away from water after surgery.
- Suture removal should be 9-12 days after surgery, but not necessarily at this institution.
- The date of your first checkup (4-6 weeks post op) will be found in your Hospital Discharge Summary papers.
- Rehabilitation - as discussed with the treating doctor and under the care of specialists.

## **WHAT HAPPENS IN THE EVENT SURGERY IS CANCELLED?**

- The nerve root may be permanently damaged, due to the lengthy compression time.
- The pain in the spine and the lower extremities may increase further.
- The limitations on your movements may become more serious.
- The quality of your life may continue to deteriorate.
- Surgery performed at a later date may be technically more difficult with the likelihood of success diminished.

## **POSSIBLE SURGICAL COMPLICATIONS**

### **1. POSSIBLE UNFORESEEN COMPLICATIONS OF SURGERY**

- The membranous sac that encases the spinal cord, the dural sac, may tear. In certain situations during surgery, the dural sac may open causing the liquid (the cerebrospinal fluid) contained within to freely flow out. The membrane is immediately closed with sutures and adhesives. Healing of the membrane occurs in 3-5 days, during which time, in order to keep the pressure of the liquid low, you will be required to lie flat on your back and will not be allowed to get out of bed.
- Although this happens seldom, the nerve root may be functionally damaged. This is, generally, due to circulatory/mechanical damage resulting from the forced tight conditions of nerve root decompression. This may be temporary or permanent and may influence nerve root function partly or completely. Symptoms: sensory disturbance, muscle weakness

(temporary or permanent, partial or complete palsy in certain muscle groups) in the affected areas.

## 2. EARLY POSSIBLE COMPLICATIONS, 1-2 DAYS FOLLOWING SURGERY

- Post surgical pain in the legs or muscle weakness. This is due to oedema and swelling of the nerve. Infusion, physiotherapy and electrotherapy treatments may be required.
- Urination difficulties might temporarily require catheterizing and the bladder may need treatment (exercise, medication).

## 3. COMPLICATIONS THAT MIGHT ARISE 3-4 DAYS FOLLOWING SURGERY

- Suppurative wound. Bacteria living in our system but not causing diseases may settle in the fresh surgical wound causing its suppuration. This process has typical symptoms:
  - a. Wound inflammation: erythema, swelling, pain, warm to touch, discharge
  - b. General symptoms: fever, despondency, general indisposition

The suppurative wound can usually be treated with antibiotics and local cold treatments, although, surgery may be necessary at times in order to clean the wound and put a drain in place. The drain will continue the cleaning process for 5-6 days during which time, depending on the condition of the Patient, mobilization may be started.

## 4. POSSIBLE FUTURE COMPLICATIONS

- Thrombosis – inflammation of lower extremity varicose veins.
- Pulmonary embolism – blockage of artery in the lungs.
- Functional disorder of the bladder and rectal muscles.

## WHY IS PHYSIOHTERAPY IMPORTANT?



The spine requires special attention and care following successful surgery. As the result of surgery, the spine segment involved changes in structure, increasing the load on the neighboring spine segments. It is extremely important that the functional capacity of the operated spine segment be restored and the neighboring areas protected through special kinesitherapy. In order to avoid overloading the spine, correct posture change and workflow should be taught within the context of ergonomics as well as preparing the body for sports.

The healing period following surgery may be divided into several phases. In addition to the required medical care, for the spine to be completely restored, various movement programs are necessary together with ergonomic consultation. This is where physiotherapy can provide excellent care.

### **PHASE 1. FIRST 6 WEEKS FOLLOWING SURGERY**

Targeted kinesitherapy and ergonomic life style consultation is started the day following surgery, as allowed by the Patient's condition.

The goal of the kinesitherapy is to regain, as soon as possible, the body functions necessary for self-sufficiency (turning in bed, sitting up, sitting, standing up, walking, etc.), to unburden and avoid unnecessary weight bearing on the operated spine segment as well as pain free posture and gait.

Ergonomic consultation includes practicing the series of movements required for basic self-sufficiency while maintaining the physiologic curvature of the spine as well as determining precisely the extent to which the spine can be or should be loaded (the amount of time spent sitting, standing, walking, how much weight may be carried, etc.) during this phase.

You should avoid extreme movements of the spine that include forward bending, trunk twisting or sideways bending even while turning, sitting or standing up from bed.

Long periods of static sitting or standing should be avoided. Even individuals with hardened musculature will feel its tiring effects after 15 minutes and resulting in a stooped posture.

Walking, light work and physiotherapy may be increased a little every day.

Rest and activities should be a little but often.

### **PHASE 2. SECOND 6 WEEKS FOLLOWING SURGERY (SECOND STAGE OF TISSUE RECOVERY)**

The goal of the early rehabilitation phase is to return you to your everyday activities, to restore the functions and the reduced functional capacity (range of movement, strength, endurance) of the operated spine segment.

Within the framework of ergonomics, we will practice the daily used movement patterns (both at home and at work) while protecting the spine and, furthermore, will determine the spine's loading capacity.

Longer and longer walks and hikes on a variety of terrains.

Swimming and underwater exercise recommended.

Static loading (sitting, lolling about) may be increased until there is no pain.

The prevalent stooped posture will be replaced with other body postures (kneeling, squatting, down on all fours).

### **PHASE 3. THREE MONTHS FOLLOWING SURGERY**

The goal of the later rehabilitation phase is to establish realistic personal goals and create safe daily and sports activities.

The targeted movement program will help develop the trunk musculature and re-establish muscle balance to actively support and protect the spine from possible overloading.

Sports preparedness (sports specificity) will play a significant role in ergonomic consultation along with protection of the spine.

We offer six-week and three-month post-op outpatient group physiotherapy (max. 5 persons) sessions covered by public health insurance. Individual condition evaluation precedes the physiotherapy in all cases. The evaluation is by appointment which you may request by calling our dispatchers at (1) 887-7900. Following the evaluation, the physiotherapist will, based on professional aspects, decide which personal movement program to recommend and personally help you register for the group physiotherapy sessions. Doctor's referral is required for both the condition evaluation and the group physiotherapy. Should you prefer **individual physiotherapy** sessions, these are available privately. For details, please turn to the dispatchers.

Please bring your own ambulatory aids (walkers, elbow crutches, etc.) at the time of admission.

## **REHABILITATION FOLLOWING SURGERY**

The spine segment involved cannot be considered healed immediately following surgery. Thus, in order to protect the spine and help the healing process, it is very important that you listen to and follow the advice of the professionals leading the rehabilitation.

The six weeks following surgery is the first regeneration phase. This is a seemingly slow, but active time during which you need to endeavor to develop a new life style.

In order for a new action or behavior to become permanent or habitual, it has to be repeated regularly for an entire month. This holds true when attempting to change a life style.

## **WHEN IS SURGERY CONSIDERED A SUCCESS?**

Surgery is considered a success when your condition and your quality of life following surgery improved.

It is important to remember that this is a process – a process that slows down at times because the “nerve is slow to forget”.

Unfortunately, a successful surgery does not stop the aging process nor does it solve the problems and tensions affecting body and soul resulting from your life style and outside stresses. Thus, it is important that you work toward a healthy life style, exercise, avoid loading the spine improperly and stabilize your spine through activities that decrease tension (i.e., relaxation, yoga, etc.) and lower the risk of a new spine problem.

## Psychotherapy Department

### PRE-SURGERY INFORMATION

The Psychotherapy Department has been in partnership with the medical staff of the National Center for Spinal Disorders since its inception, working closely together in caring for all your health care needs with our colleagues, psychologists and psychiatrists committed to the research and treatment of pain.

#### WHAT IS THE CONNECTION BETWEEN EMOTIONAL AND PHYSICAL PAIN?

When in distress, the body has a choice and prepares itself for a fight or flight. This ancient reflex tenses the muscles at the same time getting them ready to assault or flee. The result of the constant tension, however, is pain.

Stress ► Muscle Tension ► Pain

Pain may begin with an episode that is primarily a physical injury, but, when the pain persists for several months down the road, then it is very probable that the psychological stress and the physical drain have become permanent, at the same time. The acute injury has turned into chronic muscle tension which is now causing the pain.

The constant tense back muscles can further worsen the condition of the spine.

“I don’t feel harassed – don’t feel that this applies to me.”

People vary significantly in the way they acknowledge inner and outside stresses. Some cry easily, immediately feel the smallest changes in their bodies, while others only notice changes when there is a problem or pain.

The latter is typical of those suffering from **chronic pain**. They tolerate much for a long time, and attempt not to dwell on it, to bear it. Yet, pain is stressful in and of itself – inner stress.

It may be that later, they begin to worry about their back pain which causes the back muscles to tense even further. This, of course, increases the pain. Soon, the devilish cycle begins wherein the pain causes emotional stress, causing the muscles to tense more, which then causes even stronger pain, causing more emotional stress, leading to even more pain.

Most chronic pain sufferers experience their indisposition, fear and hopelessness as bodily torments which others experience on an emotional level. This is why we often hear: “I don’t need a psychologist or psychiatrist, my back hurts, that’s all!” This, in reality, is a mistaken opinion. Chronic pain is both an emotional and a physical agony causing not only our physical but also our emotional condition to worsen.

**You are now about to undergo an important first or repeat spine surgery.** Your doctor has discussed with you the surgery necessary for changing the current anatomical condition of your spine. It is also important for you to know that your current state is affected not only by your physical injury and the changes your spine is undergoing but also by the chronic stress and its negative emotional consequences.

Surgery will “only” have an effect on your spine. It will have no influence on your emotional state, feelings, thoughts or life style. Thus, the increased tension (felt in the tightness of your back muscles), fear, depression and feelings of hopelessness that you might have felt so often, have experienced or are experiencing currently can only be changed with your cooperation.

**In order to end this diabolical cycle, psychological and medication (psychopharmacological) treatment and consultation may be – and usually is – required.**

Fifty percent of chronic pain sufferers definitely suffer from depression with the remainder living in a state of high stress and tension (resulting in sleep disorders and a variety of physical symptoms).

Thus, in order to best care for our patients, we ask that you fill out the “**Condition Evaluation**” form to provide us with information regarding your emotional state. Should the questions show that you are suffering from depression or anxiety, we will help you by personally conversing with you and having you undergo individualized tests.

It is natural and you should expect surgery to increase your emotional tensions for which reason you will need a period of convalescence (the postoperative period) in order to overcome the effects of surgery. Usually, it takes 4-6 weeks until you notice any signs of recovery.

**Important! Do get enough sleep before and after surgery!** If, for instance, you have sleeping difficulties, be it due to pain or other reasons, do let your treating doctor know since a sleeping disorder is the first sign of decreased psychic stability and emotional strength.

Once we are able to end the diabolical cycle of pain, with your help, and with expert medical intervention create the necessary physical conditions your quality of life will greatly improve. In order for your suffering to decrease, however, your cooperation will be needed. First of all, you will need to have patience, especially during the early period of convalescence, so that you may enjoy each day the minute changes and to allow yourself time for regeneration. You will need to accept the fact that your pain will change slowly, which may be reminder for you to make changes in your life and emotional state. Gradual increase in activity (our physiotherapists will offer detailed advice and instruction), proper stress regulating and mood elevating treatments (you may count on our psychologists and psychiatrists for assistance) and changes in life style (weight loss, increased activity) will lead you out of suffering into a FULL LIFE!



Our psychologists will be at your disposal during your hospital stay. Please let your treating doctor or nurse know should you wish to see them

Noémi Császár, PhD  
University Professor  
Head of Department of Psychiatry

## CONSENT TO SURGERY

### **DISORDER: LUMBAR SPINE STENOSIS SURGERY: NERVE ROOT DECOMPRESSION, RECALIBRATION**

I, the undersigned, do hereby attest that:

- I have carefully read the detailed information given to me by my treating doctor regarding the above surgery.
- I was informed regarding my disorder and the reason for my resulting complaints as well as the course my disorder might take should I not choose surgery. I understand that, according to today's best medical knowledge, permanent improvement of my condition can only be attained through surgery. My questions regarding the surgery have been fully answered.
- I was informed regarding the advantages and possible disadvantages of surgery.
- I was given to understand the concept of surgical risk.
- I was informed in detail regarding possible complications, their probability, the nature and treatment as well as the temporary or enduring but seldom occurring terminal condition deterioration resulting from surgery.
- I understand that I might have to wear an exterior fixation device for three months following surgery.
- I consent to a blood transfusion should it become necessary during the course of surgery.
- I was informed regarding postoperative treatments.
- The anaesthesiologist has informed me regarding the anaesthesia for which I give my consent separately.
- Having carefully considered all of the above facts and in order to treat my disorder, I request that the surgeon chosen by the Head of the Department perform the surgery to which I give my consent.
- I have no further questions regarding the surgery.

Having read the foregoing, I, the undersigned being of sound of mind, do hereby sign this Consent of my own free will and volition in the presence of two Witnesses.

Budapest, .....

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*Surgeon*

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*Patient or Legal Guardian*

Witness (Name, Address): .....

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Witness (Name, Address): .....

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